DPU Series

DPU Communication (RS485)

Communication Manual MCY-DPUC1-V1.3_EN

Thank you for purchasing an Autonics product.
This user manual contains information about the product and its proper use,
and should be kept in a place where it will be easy to access.

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Contents

Preface

Thank you for purchasing Autonics products.
Be sure to read and follow the **Safety Precautions** thoroughly before use.
This manual contains information about the product and how to use it properly, so keep it in a place where users can easily find it.

Manual Guide

- Use the product after fully reading the contents of the manual.
- The manual explains the product functions in detail and does not guarantee the contents other than the manual.
- Any or all of the manual may not be edited or copied without permission.
- The manual is not provided with the product.
- Download and use from our website (www.autonics.com).
- The contents of the manual are subject to change without prior notice according to the improvement of the product's performance, and upgrade notices are provided through our website.
- We put a lot of effort to make the contents of the manual a little easier and more accurate. Nevertheless, if you have any corrections or questions, please feel free to comment through our website.

Common Symbols in the Manual

Failure to follow instructions may result in serious injury or death.

Failure to follow instructions may result in injury or product damage.

Supplementary explanation of the function

Example of that function

Important information about the feature

1. Modbus RTU Protocol

Modbus is an industrial protocol developed in 1979 for serial communication between devices. Its functionality has gradually expanded to allow implementation in TCP/IP and UDP environments, and it is now widely used for simple, stable, and efficient communication in various network environments. This protocol has become the standard communication method in industrial automation systems, SCADA (Supervisory Control and Data Acquisition systems), and other industrial networks.

Modbus RTU transmits data in a continuous binary format, making it more efficient and faster than ASCII transmission. The frame structure does not clearly distinguish the start and end, but defines the start and end by leaving a silent interval (3.5 character times) between frames.

For more detailed information about Modbus protocol, refer to the documentation provided by the developer.

1.1. Function Code Frame Structure

1.1.1. 01 (0x01) Read Coil Status

Reads the ON/OFF status of output (0X reference, coil) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x01 (Read Coil Status)
Starting address	2-byte	Starting address of the coil to be read
Quantity of coils	2-byte	Number of coils
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Starting address		Quantity of coils		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x01 (Read Coil Status)
Byte count	1-byte	Number of bytes in the returned data
Coil status	**N**-byte	The status of the requested coils is represented. Each coil's status is represented by 1 bit, and 8 coil statuses are grouped into 1 byte. • N = number of coils / 8 • If the remainder is not zero when divided by 8: N = N + 1
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Byte count	Coil status	CRC check	
1-byte	1-byte	1-byte	**N** × byte	Low	High
				1-byte	1-byte
CRC-16					

1.1.2. 02 (0x02) Read Input Status

Reads the ON/OFF status of input (1X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x02 (Read Input Status)
Starting address	2-byte	Starting address of the input to be read
Quantity of inputs	2-byte	Number of inputs
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Starting address		Quantity of inputs		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x02 (Read Input Status)
Byte count	1-byte	Number of bytes in the returned data
Input status	**N**-byte	The status of the requested inputs is represented. Each input's status is represented by 1 bit, and 8 input statuses are grouped into 1 byte. • N = number of inputs / 8 • If the remainder is not zero when divided by 8: N = N + 1
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Byte count	Input status	CRC check	
1-byte	1-byte	1-byte	**N** × byte	Low	High
				1-byte	1-byte
CRC-16					

1.1.3. 03 (0x03) Read Holding Registers

Reads the binary data of holding registers (4X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x03 (Read Holding Registers)
Starting address	2-byte	Starting address of the first register to be read
Quantity of registers	2-byte	Number of registers
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Starting address		Quantity of registers		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x03 (Read Holding Registers)
Byte count	1-byte	Number of bytes in the returned data (Number of registers read × 2-byte)
Register value	**N** × 2-byte	The values of the requested registers are represented. Each register is represented by 2 bytes. • N is determined by the number of requested registers.
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Byte count	Register value		CRC check	
1-byte	1-byte	1-byte	High	Low	Low	High
			1-byte	**1-byte**	1-byte	1-byte
CRC-16						

1.1.4. 04 (0x04) Read Input Registers

Reads the binary data of input registers (3X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x04 (Read Input Registers)
Starting address	2-byte	Starting address of the first input register to be read
Quantity of input registers	2-byte	Number of input registers
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Starting address		Quantity of input registers		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x04 (Read Input Registers)
Byte count	1-byte	Number of bytes in the returned data (Number of registers read × 2-byte)
Register value	**N** × 2-byte	The values of the requested input registers are represented. Each register is represented by 2 bytes. • N is determined by the number of requested registers.
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Byte count	Register value		CRC check	
1-byte	1-byte	1-byte	High	Low	Low	High
			1-byte	**1-byte**	1-byte	1-byte
CRC-16						

1.1.5. 05 (0x05) Force Single Coil

Forces a single coil (0X reference) to either ON (0xFF00) or OFF (0x0000) status in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x05 (Force Single Coil)
Coil address	2-byte	Address of the coil to be forced
Force data	2-byte	Sets or resets the coil. (0xFF00 = ON, 0x0000 = OFF)
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Coil address		Force data		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x05 (Force Single Coil)
Coil address	2-byte	Address of the coil that was forced
Force data	2-byte	The status of the coil is represented. (0xFF00 = ON, 0x0000 = OFF)
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Coil address		Force data		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

1.1.6. 06 (0x06) Preset Single Register

Writes the binary data to a single holding register (4X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x06 (Preset Single Register)
Register address	2-byte	Address of the register to be preset
Preset data	2-byte	Value to be preset
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Register address		Preset data		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x06 (Preset Single Register)
Register address	2-byte	Address of the register that was preset
Preset data	2-byte	Value preset to the register
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Register address		Preset data		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

1.1.7. 16 (0x10) Preset Multiple Registers

Writes the binary data continuously to multiple holding registers (4X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x10 (Preset Multiple Registers)
Starting address	2-byte	Starting address of the first register to be preset
Quantity of registers	2-byte	Number of registers to be preset
Byte count	1-byte	Number of bytes for the register values to be preset (Number of registers to be preset × 2-byte)
Register values	**N** × 2-byte	The values of the registers to be preset are represented. • N is determined by the number of registers to be preset.
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave addr.	Func. code	Starting addr.		Quantity of registers		Byte count	Register values		CRC check	
1-byte	1-byte	High	Low	High	Low	1-byte	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte		**1-byte**	**1-byte**	1-byte	1-byte
CRC-16										

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x10 (Preset Multiple Registers)
Starting address	2-byte	Starting address of the first register that was preset
Quantity of registers	2-byte	Number of registers that were preset
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Starting address		Quantity of registers		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Except when downloading parameters with predefined minimum, maximum, or default values based on the input specifications in the PC loader program, it is recommended to use Preset Single Register rather than Preset Multiple Registers when connecting to external devices such as PLCs or graphic panels.

1.2. Exception Handling

In case of a communication error, the slave device sets the highest bit of the received function code to 1 in its response. It then sends only the exception code, without including any data related to the original request.

Exception response frame

Slave address	Function code + 0x80	Exception code	CRC check
1-byte	1-byte	1-byte	2-byte
CRC-16			

Exception codes

Exception code	Code name	Description
01	ILLEGAL FUNCTION	If the command is not supported.
02	ILLEGAL DATA ADDRESS	If the requested data address is invalid. (e.g. The data address does not exist or the address range is incorrect.)
03	ILLEGAL DATA VALUE	If the requested data value is invalid. (e.g. The data value is out of the allowable range.)
04	SLAVE DEVICE FAILURE	If the parameter is locked, communication write is prohibited, or the command cannot be processed correctly.
06	SLAVE DEVICE BUSY	If the device is in a state where it cannot execute the requested command.

2. Modbus Mapping Table

2.1. Input reisters [Func: 04, R / W: R]

2.1.1. DPU1 Series

No (Address)	Parameter	Default	Weight	Unit
300001 (0000)	Output voltage	-	x 0.1	V
300002 (0001)	Load current	-	x 0.1	A
300003 (0002)	Power	-	x 0.1	W
300004 (0003)	Load status	-	x 0.1	%
300005 (0004)	Power frequency	-	x 0.01	Hz
300101 (0064)	Device number	-	-	-
300102 (0065)	Device number	-	-	-
300103 (0066)	H/W version	-	-	-
300104 (0067)	S/W version	-	-	-
300105 (0068)	Model name 1	DP	-	-
300106 (0069)	Model name 2	2-	-	-
300107 (006A)	Model name 3	00	-	-
300108 (006B)	Model name 4	-	-	-
300109 (006C)	Model name 5	-	-	-
300110 (006D)	Model name 6	-	-	-
300111 (006E)	Model name 7	-	-	-
300112 (006F)	Model name 8	-	-	-
300113 (0070)	Model name 9	-	-	-
300114 (0071)	Model name 10	-	-	-
300115 (0072)	Reserved 1	-	-	-
300116 (0073)	Reserved 2	-	-	-
300117 (0074)	Reserved 3	-	-	-
300118 (0075)	Coil start address	0	-	-
300119 (0076)	Coil quantity	0	-	-
300120 (0077)	Input start address	0	-	-
300121 (0078)	Input quantity	0	-	-

No (Address)	Parameter	Default	Weight	Unit
300122 (0079)	Holding reg start address	0	-	-
300123 (007A)	Holding reg quantity	32	-	-
300124 (007B)	Input reg start address	0	-	-
300125 (007C)	Input reg quantity	5	-	-

2.1.2. DPU3 Series

No (Address)	Parameter	Default	Weight	Unit
300001 (0000)	U-V line load voltage	-	x 0.1	V
300002 (0001)	V-W line load voltage	-	x 0.1	V
300003 (0002)	W-U line load voltage	-	x 0.1	V
300004 (0003)	U-phase load current	-	x 0.1	A
300005 (0004)	V-phase load current	-	x 0.1	A
300006 (0005)	W-phase load current	-	x 0.1	A
300007 (0006)	Power	-	x 0.01	W
300008 (0007)	Load status	-	x 0.1	%
300009 (0008)	Power frequency	-	x 0.01	Hz
300101 (0064)	Device number	-	-	-
300102 (0065)	Device number	-	-	-
300103 (0066)	H/W version	-	-	-
300104 (0067)	S/W version	-	-	-
300105 (0068)	Model name 1	DP	-	-
300106 (0069)	Model name 2	2-	-	-
300107 (006A)	Model name 3	00	-	-
300108 (006B)	Model name 4	-	-	-
300109 (006C)	Model name 5	-	-	-
300110 (006D)	Model name 6	-	-	-
300111 (006E)	Model name 7	-	-	-
300112 (006F)	Model name 8	-	-	-
300113 (0070)	Model name 9	-	-	-
300114 (0071)	Model name 10	-	-	-
300115 (0072)	Reserved 1	-	-	-
300116 (0073)	Reserved 2	-	-	-
300117 (0074)	Reserved 3	-	-	-
300118 (0075)	Coil start address	0	-	-
300119 (0076)	Coil quantity	0	-	-
300120 (0077)	Input start address	0	-	-
300121 (0078)	Input quantity	0	-	-
300122 (0079)	Holding reg start address	0	-	-
300123 (007A)	Holding reg quantity	32	-	-
300124 (007B)	Input reg start address	0	-	-

No (Address)	Parameter	Default	Weight	Unit
300125 (007C)	Input reg quantity	5	-	-

2.2. Holding reisters [Func: 03, 06, 16, R / W: R / W]

2.2.1. DPU1 Series

No (Address)	Parameter (Description)	Set range	Weight	Default	Unit	Save
400001 (0000)	Reference Value (Communication control input)	0 to 1000	x 0.1	0.0	%	Y
400002 (0001)	Start Limit Time	0 to 100	x 1	0	sec	Y
400003 (0002)	Start Limit	0 to 1100	x 0.1	110.0	%	Y
400004 (0003)	Soft Start Time	0 to 100	x 1	0	sec	Y
400005 (0004)	Output High-Limit value	0 to 1100	x 0.1	110.0	%	Y
400006 (0005)	Output Low-Limit value	0 to 1100	x 0.1	0.0	%	Y
400007 (0006)	Remote SP1 (Setting Point 1)	0 to 1000	x 0.1	0.0	%	Y
400008 (0007)	Remote SP2 (Setting Point 2)	0 to 1000	x 0.1	0.0	%	Y
400009 (0008)	Remote SP3 (Setting Point 3)	0 to 1000	x 0.1	0.0	%	Y
400010 (0009)	Remote SP4 (Setting Point 4)	0 to 1000	x 0.1	0.0	%	Y
400011 (000A)	Remote SP5 (Setting Point 5)	0 to 1000	x 0.1	0.0	%	Y
400012 (000B)	Remote SP6 (Setting Point 6)	0 to 1000	x 0.1	0.0	%	Y
400013 (000C)	Soft Up Time	0 to 999	x 1	3	sec	Y
400014 (000D)	Soft Down Time	0 to 999	x 1	3	sec	Y
400015 (000E)	Current Limit	0 to 1100	x 0.1	110	%	Y

No (Address)	Parameter (Description)	Set range	Weight	Default	Unit	Save
400016 (000F)	Overcurrent alarm value	0 to 1200	x 0.1	110	%	Y
400017 (0010)	Overcurrent delay time	0 to 100	x 1	5	sec	Y
400018 (0011)	Overvoltage alarm value	0 to 1200	x 0.1	110	%	Y
400019 (0012)	Overvoltage delay time	0 to 100	x 1	5	sec	Y
400020 (0013)	Heater break alarm value	100 to 5000	x 0.1	10.0	%	Y
400021 (0014)	Display value content	0: Load voltage 1: Load current 2: Load power 3: Control iput	-	0	-	Y
400022 (0015)	Bar content	0: Load voltage 1: Load current 2: Load power 3: Control iput	-	0	-	Y
400023 (0016)	Proportional constant	1 to 2000	x 1	150	-	Y
400024 (0017)	Integral constant	1 to 9999	x 0.1	20.0	sec	Y
400025 (0018)	Control Method	0: Fixed cycle control 1: Variable cycle control 2: ON / OFF control 3: Phase control 4: Constant voltage feedback 5: Constant current feedback 6: Constant power feedback	-	3	-	Y

No (Address)	Parameter (Description)	Set range	Weight	Default	Unit	Save
400026 (0019)	Digital input 1	0: Multi setting point 1: Single setting point 1 2: Single setting point 2 3: Single setting point 3 4: Reset (Turn digital input ON and OFF, this unit resets and restarts.) 5: HOLD (It operates hold the output and display value when digital input maintains ON status.)	-	0	-	Y
400027 (001A)	Digital input 2	1: Single setting point 1 2: Single setting point 2 3: Single setting point 3 4: Reset (Turn digital input ON and OFF, this unit resets and restarts.) 5: HOLD (It operates hold the output and display value when digital input maintains ON status.)	-	1	-	Y
400028 (001B)	Digital input 3	1: Single setting point 1 2: Single setting point 2 3: Single setting point 3 4: Reset (Turn digital input ON and OFF, this unit resets and restarts.) 5: HOLD (It operates hold the output and display value when digital input maintains ON status.)	-	1	-	Y
400029 (001C)	Control input type	0: 4 - 20 mA 1: 0 - 20 mA 2: 1 - 5 VDC 3: 0 - 5 VDC 4: 0 - 10 VDC 5: SSR contact (Voltage / Non-voltage) 6: RS485 communication	-	0	-	Y

<table>
<tr><th>No
(Address)</th><th>Parameter
(Description)</th><th>Set range</th><th>Weight</th><th>Default</th><th>Unit</th><th>Save</th></tr>
<tr><td>400030
(001D)</td><td>Load resistance display method</td><td>0: Down (Decrease rate of number of loads)
1: Up (Increase rate of load resistance)</td><td>-</td><td>0</td><td>-</td><td>Y</td></tr>
<tr><td>400031
(001E)</td><td colspan="2">Operation
(Description of operation of 001E 16-bit)
<table><tr><th>Bit</th><th>Operation</th></tr><tr><td>Bit0</td><td>1: At least one of Bit1 to Bit9 occurs</td></tr><tr><td>Bit1</td><td>1: Over 150 % over current</td></tr><tr><td>Bit2</td><td>1: Over 110 % over current</td></tr><tr><td>Bit3</td><td>1: Over voltage</td></tr><tr><td>Bit4</td><td>1: Temperature error</td></tr><tr><td>Bit5</td><td>1: Fuse break</td></tr><tr><td>Bit6</td><td>-</td></tr><tr><td>Bit7</td><td>1: No load</td></tr><tr><td>Bit8</td><td>1: SCR error</td></tr><tr><td>Bit9</td><td>1: Frequency error</td></tr><tr><td>Bit10</td><td>-</td></tr><tr><td>Bit11</td><td>-</td></tr><tr><td>Bit12</td><td>1: Run
0: Stop</td></tr><tr><td>Bit13</td><td>1: Manual
0: Auto</td></tr><tr><td>Bit14</td><td>1: Digital input</td></tr></table></td><td>-</td><td>0</td><td>-</td><td>N</td></tr>
<tr><td>400032
(001F)</td><td>Output slope</td><td>0 to 1000</td><td>x 0.001</td><td>1.000</td><td>%</td><td>Y</td></tr>
<tr><td>400033
(0020)</td><td>Base Up</td><td>0 to 1000</td><td>x 0.1</td><td>0.0</td><td>%</td><td>Y</td></tr>
<tr><td>400034
(0021)</td><td>Input correction</td><td>-999 to 999</td><td>x 0.1</td><td>0.0</td><td>-</td><td>Y</td></tr>
<tr><td>400035
(0022)</td><td>Input slope correction</td><td>-999 to 999</td><td>x 0.1</td><td>0.0</td><td>-</td><td>Y</td></tr>
</table>

No (Address)	Parameter (Description)	Set range	Weight	Default	Unit	Save
400036 (0023)	Overcurrent alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400038 (0025)	Overvoltage alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400039 (0026)	Fuse break alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400041 (0028)	Heat sink overheating alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400042 (0029)	SCR error alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400043 (002A)	Heater break alarm CH	0: NONE 1: AL1 2: AL2	-	2	-	Y
400044 (002B)	Output slope manual adjustment	0: OFF (Disable) 1: ON (Enable)	-	0	-	Y
400045 (002C)	Heater break alarm delay time	0: 0 sec 1: 1 sec 2: 2 sec 3: 3 sec 4: 5 sec 5: 10 sec 6: 20 sec 7: 30 sec	-	7	sec	Y

- Even if parameters cannot be set on the device, they can be changed through communication.

2.2.2. DPU3 Series

No (Address)	Parameter (Description)	Set range	Weight	Default	Unit	Save
400001 (0000)	Reference Value (Communication control input)	0 to 1000	x 0.1	0.0	%	Y
400002 (0001)	Start Limit Time	0 to 100	x 1	0	sec	Y
400003 (0002)	Start Limit	0 to 1100	x 0.1	110.0	%	Y
400004 (0003)	Soft Start Time	0 to 100	x 1	0	sec	Y
400005 (0004)	Output High-Limit value	0 to 1100	x 0.1	110.0	%	Y
400006 (0005)	Output Low-Limit value	0 to 1100	x 0.1	0.0	%	Y
400007 (0006)	Remote SP1 (Setting Point 1)	0 to 1000	x 0.1	0.0	%	Y
400008 (0007)	Remote SP2 (Setting Point 2)	0 to 1000	x 0.1	0.0	%	Y
400009 (0008)	Remote SP3 (Setting Point 3)	0 to 1000	x 0.1	0.0	%	Y
400010 (0009)	Remote SP4 (Setting Point 4)	0 to 1000	x 0.1	0.0	%	Y
400011 (000A)	Remote SP5 (Setting Point 5)	0 to 1000	x 0.1	0.0	%	Y
400012 (000B)	Remote SP6 (Setting Point 6)	0 to 1000	x 0.1	0.0	%	Y
400013 (000C)	Soft Up Time	0 to 999	x 1	3	sec	Y
400014 (000D)	Soft Down Time	0 to 999	x 1	3	sec	Y
400015 (000E)	Current Limit	0 to 1100	x 0.1	110	%	Y
400016 (000F)	Overcurrent alarm value	0 to 1200	x 0.1	110	%	Y
400017 (0010)	Overcurrent delay time	0 to 100	x 1	5	sec	Y

No (Address)	Parameter (Description)	Set range	Weight	Default	Unit	Save
400018 (0011)	Overvoltage alarm value	0 to 3000	x 0.1	110	%	Y
400019 (0012)	Overvoltage delay time	0 to 100	x 1	5	sec	Y
400020 (0013)	Heater break alarm value	100 to 5000	x 0.1	10.0	%	Y
400021 (0014)	Display value content	0: U-V line load voltage 1: V-W line load voltage 2: W-U line load voltage 3: U-phase load current 4: V-phase load current 5: W-phase load current 6: Load power 7: Control input	-	0	-	Y
400022 (0015)	Bar content	0: U-V line load voltage 1: V-W line load voltage 2: W-U line load voltage 3: U-phase load current 4: V-phase load current 5: W-phase load current 6: Load power 7: Control input	-	0	-	Y
400023 (0016)	Proportional constant	1 to 2000	x 1	150	-	Y
400024 (0017)	Integral constant	1 to 9999	x 0.1	20.0	sec	Y
400025 (0018)	Control Method	1: Fixed cycle control 2: ON / OFF control 3: Phase control 4: Constant voltage feedback 5: Constant current feedback 6: Constant power feedback	-	3	-	Y

No (Address)	Parameter (Description)	Set range	Weight	Default	Unit	Save
400026 (0019)	Digital input 1	0: Multi setting point 1: Single setting point 1 2: Single setting point 2 3: Single setting point 3 4: Reset (Turn digital input ON and OFF, this unit resets and restarts.) 5: HOLD (It operates hold the output and display value when digital input maintains ON status.)	-	0	-	Y
400027 (001A)	Digital input 2	1: Single setting point 1 2: Single setting point 2 3: Single setting point 3 4: Reset (Turn digital input ON and OFF, this unit resets and restarts.) 5: HOLD (It operates hold the output and display value when digital input maintains ON status.)	-	1	-	Y
400028 (001B)	Digital input 3	1: Single setting point 1 2: Single setting point 2 3: Single setting point 3 4: Reset (Turn digital input ON and OFF, this unit resets and restarts.) 5: HOLD (It operates hold the output and display value when digital input maintains ON status.)	-	1	-	Y
400029 (001C)	Control input type	0: 4 - 20 mA 1: 0 - 20 mA 2: 1 - 5 VDC 3: 0 - 5 VDC 4: 0 - 10 VDC 5: SSR contact (Voltage / Non-voltage) 6: RS485 communication	-	0	-	Y

<table>
<tr><th>No
(Address)</th><th>Parameter
(Description)</th><th>Set range</th><th>Weight</th><th>Default</th><th>Unit</th><th>Save</th></tr>
<tr><td>400030
(001D)</td><td>Load resistance display method</td><td>0: Down (Decrease rate of number of loads)
1: Up (Increase rate of load resistance)</td><td>-</td><td>0</td><td>-</td><td>Y</td></tr>
<tr><td>400031
(001E)</td><td colspan="2">Operation
(Description of operation of 001E 16-bit)
<table><tr><th>Bit</th><th>Operation</th></tr><tr><td>Bit0</td><td>1: At least one of Bit1 to Bit9 occurs</td></tr><tr><td>Bit1</td><td>1: Over 150 % over current</td></tr><tr><td>Bit2</td><td>1: Over 110 % over current</td></tr><tr><td>Bit3</td><td>1: Over voltage</td></tr><tr><td>Bit4</td><td>1: Temperature error</td></tr><tr><td>Bit5</td><td>1: Fuse break</td></tr><tr><td>Bit6</td><td>1: 3-phase voltage phase difference unbalance</td></tr><tr><td>Bit7</td><td>1: No load</td></tr><tr><td>Bit8</td><td>1: SCR error</td></tr><tr><td>Bit9</td><td>1: Frequency error</td></tr><tr><td>Bit10</td><td>-</td></tr><tr><td>Bit11</td><td>-</td></tr><tr><td>Bit12</td><td>1: Run
0: Stop</td></tr><tr><td>Bit13</td><td>1: Manual
0: Auto</td></tr><tr><td>Bit14</td><td>1: Digital input</td></tr></table></td><td>-</td><td>0</td><td>-</td><td>N</td></tr>
<tr><td>400032
(001F)</td><td>Output slope</td><td>0 to 1000</td><td>x 0.001</td><td>1.000</td><td>%</td><td>Y</td></tr>
<tr><td>400033
(0020)</td><td>Base Up</td><td>0 to 1000</td><td>x 0.1</td><td>0.0</td><td>%</td><td>Y</td></tr>
<tr><td>400034
(0021)</td><td>Input correction</td><td>-999 to 999</td><td>x 0.1</td><td>0.0</td><td>-</td><td>Y</td></tr>
<tr><td>400035
(0022)</td><td>Input slope correction</td><td>-999 to 999</td><td>x 0.1</td><td>0.0</td><td>-</td><td>Y</td></tr>
</table>

No (Address)	Parameter (Description)	Set range	Weight	Default	Unit	Save
400036 (0023)	Overcurrent alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400038 (0025)	Overvoltage alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400039 (0026)	Fuse break alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400041 (0028)	Heat sink overheating alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400042 (0029)	SCR error alarm CH	0: NONE 1: AL1 2: AL2	-	1	-	Y
400043 (002A)	Heater break alarm CH	0: NONE 1: AL1 2: AL2	-	2	-	Y
400044 (002B)	Output slope manual adjustment	0: OFF (Disable) 1: ON (Enable)	-	0	-	Y
400045 (002C)	Phase_loss alarm CH	0: NONE 1: AL1 2: AL2	-	0	-	Y

- Even if parameters cannot be set on the device, they can be changed through communication.

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Dimensions or specifications on this manual are subject to change and some models may be discontinued without notice.

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